



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,468	04/15/2005	Hongyu Yue	267159US26PCT	7011

22850 7590 09/05/2006

C. IRVIN MCCLELLAND
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

CHEN, KIN CHAN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 09/05/2006

•Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/531,468

Applicant(s)

YUE, HONGYU

Examiner

Kin-Chan Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2006 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 04152005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language. (* filing after Nov. 29, 2000*)

Claim Rejections - 35 USC § 102

2. Claims 1,2,4-11,13-18, and 21-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Harvey et al. (US 2004/0045934).

In a method for determining an endpoint of the plasma process, Harvey teaches that at least one endpoint signal may be measured. At least one filtered endpoint signal may be generated by applying a Savitsky Golay filter to the at least one endpoint signal. An endpoint of the plasma process from the at least one filtered endpoint signal may be determined. At least one filtered endpoint signal may comprise a smoothed endpoint signal and an endpoint transition. At least one filtered endpoint signal may comprise an endpoint transition. At least one endpoint signal may comprise an optical signal from the plasma processing system. The optical signal is related to a spectral irradiance of

Art Unit: 1765

emitted light from said plasma processing system. The optical signal may be measured using an optical diagnostic subsystem. The optical diagnostic subsystem comprising at least one of a detector or an optical filter. At least one filtered endpoint signal may comprise a first filtered endpoint signal and a second filtered endpoint signal. The endpoint may be determined from a differential signal, which comprises at least one of a first derivative, and a second derivative of the ratio signal. See abstract, [0012]-[0014], [0105], [0128], Figs. 5-9.

The limitations of claims 1, 2, 4, 6-9, 11,13,16-18, and 21 have been addressed above and rejected for the same reasons, *supra*.

As to dependent claim 10, Harvey teaches ([0086][0089][0099]) that the endpoint is determined from a ratio signal, which is generated by a ratio of the first filtered endpoint signal and said second filtered endpoint signal.

As to system (apparatus) claims 22-29, in order to perform the methods in claims 1, 6-7, 8, 4,5,9,10 and 11 respectively, the limitations of the aforementioned system (apparatus) claims would be included.

As to dependent claim 5, Harvey teaches determining the endpoint from at least one filtered endpoint signal comprising using at least one of a start time of the endpoint transition, an end time of the endpoint transition, and an inflection time of the endpoint transition (Figs 13A, 14A, and descriptions of the Figs).

As to dependent claims 14 and 15, Harvey teaches measuring the first (or second) endpoint signal further comprising filtering the first endpoint signal, the filtering

Art Unit: 1765

comprising at least one of a moving average, a finite impulse response filter, and a Savitsky Golay filter. See [0099][105][128].

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 12, 19, 20, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey et al. (US 2004/0045934).

In a method for determining an endpoint of the plasma process, Harvey teaches that at least one endpoint signal may be measured. At least one filtered endpoint signal may be generated by applying a Savitsky Golay filter to the at least one endpoint signal. An endpoint of the plasma process from the at least one filtered endpoint signal may be determined. At least one filtered endpoint signal may comprise a smoothed endpoint signal and an endpoint transition See abstract, [0012]-[0014], [0105], [0128], Figs. 5-9.

Harvey teaches a derivative of the one end point may be determined [0024] [0098] [0108] [0111]. Hence, it would have been obvious to one with ordinary skill in the art to perform a smoothed first derivative or second derivative of the signal (claims 3 and 20)

Art Unit: 1765

because it is simply a data manipulation and the choice of engineering depending on the requirement for obtaining the clear endpoint signal in a specific product.

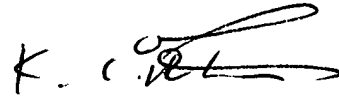
As to dependent claims 12, 19, and 30, Since Savitsky Golay filter is used in the system and process, hence, it would have been obvious to one with ordinary skill in the art to include the filter window in order to better define the range tailoring to a specific product. The above cited claims differ from the prior art by specifying well-known features (such as setting a polynomial order in the Savitsky Golay smoothing filter) to the art of data fitting and analysis, the examiner takes official notice. A person having ordinary skill in the art would have found it obvious to incorporate said Savitsky Golay smoothing technique to same in order to obtain clear endpoint signal for a specific product with a reasonable expectation of success.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

Art Unit: 1765

have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 31, 2006



Kin-Chan Chen
Primary Examiner
Art Unit 1765